

Attorney Docket No.
JWB-2000-5-P

STABILIZER ATHLETIC SHOES

Inventors

**William G. Cummings
Jay G. Levine**

002720-222950

FIELD OF THE INVENTION

This invention relates generally to athletic shoes and particularly to stabilizer athletic shoes for persons engaged in athletic activities. More specifically, this invention relates to an improved athletic shoes construction which incorporate features designed to increase foot and ankle stability during various athletic activities in order to decrease muscle fatigue, enhance performance and minimize injuries.

BACKGROUND OF THE INVENTION

Various athletic shoes are presently being marketed for different activities such as running, tennis, basketball, racquetball and golf. These shoes are designed to prevent, or at least minimize injuries caused by lateral foot ankle instability during such activities. Current athletic shoes do not adequately guard against injuries caused by all type of athletic activities, including those activities which involve side-to-side jumping motions. These activities have greater tendency for lateral foot ankle instability, and hence injury to the foot and/or ankle.

United States Paten No. 3,738,373, issued June 12, 1973 describes an athletic shoe which incorporates a flexible wedge mounted therein which extends completely to the rear edge of the heel thereby providing maximum "cushion".

An earlier patent, United States Patent No. 2,847,769, issued August 19, 1958 discloses shoes for golfers which are designed to compel a golfer to automatically assume the correct golf stance.

Other athletic shoes incorporate air-cushioning means, usually in the heels, for absorbing the impact experienced during said activities.

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So far as it is known, there is no single pair of athletic shoes which adequately affords the desired degree of protection and guards against injuries resulting from foot instability during athletic activities of the type hereinbefore mentioned. This is largely because the foot-ankle structure is complex and includes numerous joint axes with different movements and displacements in response to varying impacts and positions. Thus, the design of an athletic shoe which can protect against the different possible injuries resulting from a variety of athletic activities must take into consideration such factors as supination, pronation, dorsiflexion, plantarflexion, abduction, and adduction which occur at the foot-ankle joint during said sports activities. Accordingly, there is need for a single athletic shoe which is designed to afford maximum benefits for those engaged in various athletic activities in which foot-ankle injuries are a matter of common experiences.

It is therefore an object of the present invention to provide an athletic shoe which is designed to afford maximum protection against injuries resulting from sports activities involving jumping and side-to-side motions such as, e.g., running, jogging, basketball, tennis and racquetball.

It is a further object of this invention to provide athletes with athletic shoes which incorporate features that counter the adverse effects of such factors as supination, pronation, dorsiflexion, plantarflexion, abduction and adduction experienced by athletes during several athletic activities.

The foregoing and other objects of this invention will become more apparent from the following detailed description and accompanying drawings.

SUMMARY OF THE INVENTION

In accordance with the present invention an athletic shoe is provided which, because of its unique construction, assures dynamic foot stability, reduces lateral ankle instability and alleviate foot fatigue which often results from athletic activities such as jogging, running, tennis, basketball, jumping and even weight lifting exercises. In one embodiment, the athletic shoe comprises heel and a sole having a rear foot portion and a forefoot portion which has a medial section and a lateral section. The forefoot portion has a lateral wedge conformally affixed thereto or formed, integrally therewith, said lateral wedge member being tapered from the medial section toward the lateral mid portion of the forefoot.

In a second embodiment, the shoe is similar to the first embodiment and further includes a lateral heel stabilizer conformally attached to the heel counter, a medial heel wedge spanning the length and width of the shoe heel, and a tapered lateral forefoot member attached to the bottom sole of the shoe.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, wherein the same reference numerals in the different figures designate like parts:

Figure 1 is a side elevational partly perspective view of an athletic shoe incorporating a lateral forefoot wedge in accordance with one embodiment of the present invention;

Figure 2 is a bottom view of the shoe shown in Figure 1;

Figure 3 is a sectional view taken along the line 3-3 of Figure 1;

Figure 4 is a side elevational, partly perspective view of an athletic shoe made according to another embodiment of this invention;

Figure 5 is a bottom view of the shoe shown in Figure 4;

Figure 6 is a view taken along the line 6-6 of Figure 4; and

Figure 7 is a view taken along the line 7-7 of Figure 4;

Figures 1-7 illustrate the left shoe, it being understood that the right shoe is similar in construction with the specific features being located on opposite side of the shoe.

DETAILED DESCRIPTION OF DIFFERENT EMBODIMENTS THE INVENTION

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~~Referring to Figures 1-3, there is shown, in Figure 1, a sport shoe 10, having a flexible top portion 11 mounted on top of the shoe sole 12 and is tied around the top portion 11 by the shoe lace 13. The sole 12 extends from the toe portion 15 to the heel portion 17 which may be rigid or semi-rigid in construction. The bottom or outsole 19 (see Figure 2) may be ribbed, grooved or patterned as desired. For the purposes of use in some sports, the heel may be cushioned, or rendered resilient and capable of absorbing shocks upon impact by including air ducts, air pellets or spring means between the heel and the sole. Such constructions are well known in the prior art. For the purposes of this invention, in the embodiment shown in Figures 1-3, the shoe is provided with an external lateral forefoot wedge member 21 which is formed as an integral part of the shoe conformally contouring the lateral forefoot portion of the shoe. The lateral forefoot wedge 21 is preferably about 1/8 to about 1/4 inch thick and is tapered from medial to lateral from the middle of the forefoot, with its thickness increasing gradually toward the lateral side where it is at its greatest thickness. The lateral forefoot wedge 21 extends a distance of from about 2 to about 4 inches, from the middle toward the toe portion 15, thus extending from the 5th toe proximal to the 5th metatarsal base. The lateral forefoot wedge 21 may be made of the same material used in forming the shoes, generally hard rubber, neoprene or a plastic~~

such as a copolymer of ethylene and vinyl acetate (EVA). The provision of the lateral forefoot wedge 21 will accomplish two goals, i.e., locking the metatarsal joint at propulsive phase of gait thus producing a stronger lever arm which results in increased push-off power. In addition, it decreases lateral ankle instability in the types of sport activities which require excessive medial to lateral movements.

Referring now to the embodiment of this invention illustrated in Figures 4-7, there is shown, in Figure 4, an athletic shoe generally designated as 100 having a flexible top portion 101 mounted on top of the shoe sole 102 and tied around the top foot portion 101 by the shoe lace 103. The sole 102 extends from the toe portion 105 to the heel portion 107 which may be rigid or semi-rigid in construction. The bottom shoe sole 109 may be ribbed, grooved or patterned as desired. As in the embodiment shown in Figures 1-3, the heel may be cushioned or rendered resilient so as to withstand the impacts experienced by athletes during jumping, running, jogging and other foot-to-ground impact producing activities.

In this embodiment of the invention, and as seen in Figures 4-7, the shoe 100 is provided with an external lateral forefoot stabilizer 111, a lateral heel stabilizer 113, a medial heel wedge 115 and a bottom forefoot wedge 117, all of which contribute to the rigidity and dynamic stability of the shoe.

The lateral forefoot stabilizer 111 serves a similar function and purpose as the lateral forefoot stabilizer 21 described in conjunction with Figure 1. The lateral forefoot stabilizer 111 is made of plastic or rubber, the same as the shoe, is disposed proximal to the 5th metatarsal, is conformably attached laterally to the shoe, extending about 1 to 3 inches from the middle toward the toe portion 105. The provision of the lateral forefoot stabilizer 111 guards against lateral instability of the foot and the ankle (sprains and strains) and excessive frontal plane motions.

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102 The lateral heel stabilizer 113 is a piece of rubber or plastic (EVA) which is about 2 to 3 inches wide, about 2-3 inches high (depending on the height of the shoe) and is about 1/8 to 1/4 inch thick. The lateral heel stabilizer 113 is conformably attached to the lateral heel counter and encompasses substantially the entire heel counter from the distal end 113A to the proximal end 113B, thus adding firm support to the lateral heel and reducing lateral ankle sprains experienced in sports such as basketball and tennis. It also provides added stability and push-off power in such activity as weight lifting.

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103 The athletic shoe 100 also comprises a medial heel wedge 115, which may be ribbed, grooved or patterned as desired, and it is incorporated into the heel structure and/or affixed thereto at about 2 to 5 degrees relative to the ground. As shown in Figure 5, the wedge 115 spans the entire length and width of the heel with the highest part of the wedge being at the medial inner heel. Thus, the rear of the athletic shoe will have a mild tilt outward, i.e., away from the body. The incorporation of the medial heel wedge in the athletic shoe as aforesaid limits the pronation and inversion of the foot as the heel strikes the ground. It is a matter of common experience that most overuse syndrome, including plantar fasciitis, posterior tibial medial tendonitis, knee and lower back pain are due to, or exacerbated by over pronation or an exaggerated inward rolling of the foot. By providing a medial heel wedge as herein described, pronation will be effectively reduced, foot and leg fatigue will be alleviated and foot stability is increased, all of which contribute to dynamic stability during athletic performance. No

Referring again to Figure 5, the shoe 100 is provided, at its bottom, with a tapered lateral forefoot wedge 117 conformally contoured to the forefoot, which is approximately 1/8 to 3/16 inch thick, and is tapered medial to lateral from the middle

forefoot, with its thickest part being at the lateral side. In orthopedic jargon, the forefoot wedge 117 extends from the 5th toe proximal to the 5th metatarsal base. As previously mentioned, the inclusion of the lateral foot wedge in the shoe results in a more vertical push-off power and decreases lateral ankle stability whenever excessive medial to lateral movements are encountered.

It can be appreciated from the foregoing description of the different embodiments of the novel athletic shoes that several changes and modifications may be made in the structure of the shoe which are suggested by the description and the drawings herein. Such changes and modifications are nevertheless within the scope of the present invention.

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